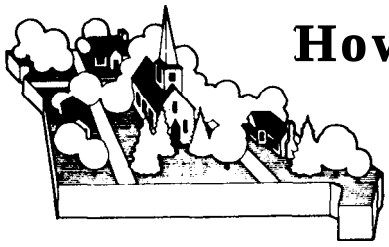


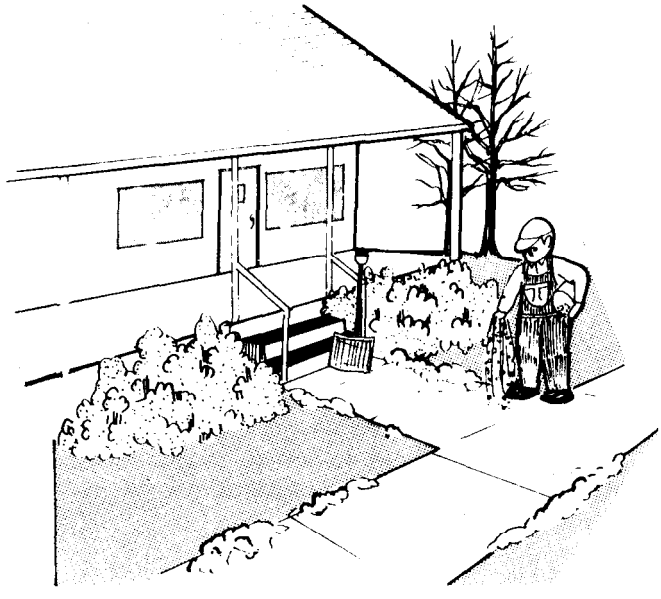
How Ice Melters Affect Plants or Name Your Poison

Our mobile society can slip and slide to a crawl when a Missouri winter arrives. Chemicals used to melt ice and snow can mean safer traveling for cars and people, but can also mean real trouble for plants and soils.

Why are ice melters a problem?

Almost all ice melting substances are technically salts, which work by causing water to remain liquid at temperatures under 32º F. Their effectiveness varies with the outside temperature. Some salts also have unfortunate side effects, which include potential harm to plants and soils, damage to concrete surfaces, corrosion of metals, and even pollution of water supplies. The problems caused by ice melters depend upon the specific chemical being used and ***how heavily it is applied.*** A choice of melting agent can be determined by its advantages compared to its disadvantages for any given situation.

Salts can damage plants in two ways: 1) as an airborne mist affecting foliage, buds, and stems, or 2) by entering the soil. Either type of contamination can cause slow growth, deformities, susceptibility to diseases, or death of plants.

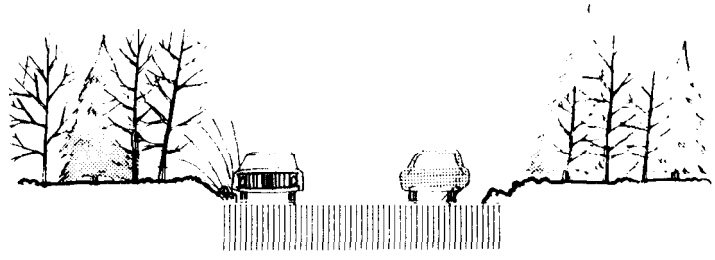


Use Ice melters with moderation. Less is required as the temperature rises.

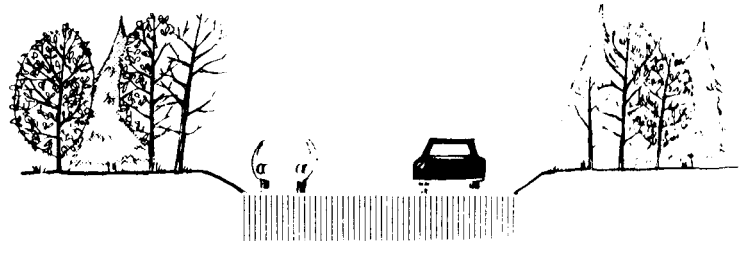
Some common ice melters

Common salt (NaCl) is the most popular ice melting agent because of its availability and relatively low cost. It is also potentially the ***most damaging*** to plants and soils. Like all of the salts mentioned below, it can draw moisture from roots. The sodium and chloride components of common salt can each interfere with nutrient intake and growth.

Sodium also accumulates in the soil and causes it to become tight and unworkable, impeding root development. Chloride can become a pollutant of the water supply if large quantities of common salt are used or stored without protection. Common salt is effective as an ice melter only above + 15º F.



Salt or other ice melters can affect plants as a ***mist*** or from ***ground contamination.***



Damage to plants may not be evident until growth resumes.

Calcium Chloride ($CaCl_2$) is also used extensively, although it is somewhat more expensive than common salt. It is effective as an ice melter at lower temperatures. It is much less toxic to plants than common salt, but can "burn" plants if applied heavily. Calcium chloride tends to attract moisture from the air even after ice is melted, and will therefore cause pavements to remain moist. It is effective at temperatures to -20º F.

Ammonium nitrate (NH_4NO_3) is a fertilizer that is occasionally used for melting ice. It is destructive to concrete and corrosive to steel. Although not the problem to plants as the above sails, ammonium nitrate or any nitrogen fertilizer can cause "burn" if it enters the root zone of the soil in sufficient concentration.

Urea ($CO(NH_2)2$) has several uses, including fertilizer and ice melter. It does not cause damage to concrete, but is relatively expensive. It can "burn" plants if applied too heavily. It is effective at temperatures above + 15º F.

Abrasives such as sand, cinders, wood ash and other gritty substances are used mainly for traction, sometimes in combination with chemicals. Abrasives can aid in melting, however, by absorbing heat from sunshine. They do not pose serious threats to the environment if applied independent of chemicals.

Treating for salt damage to plants

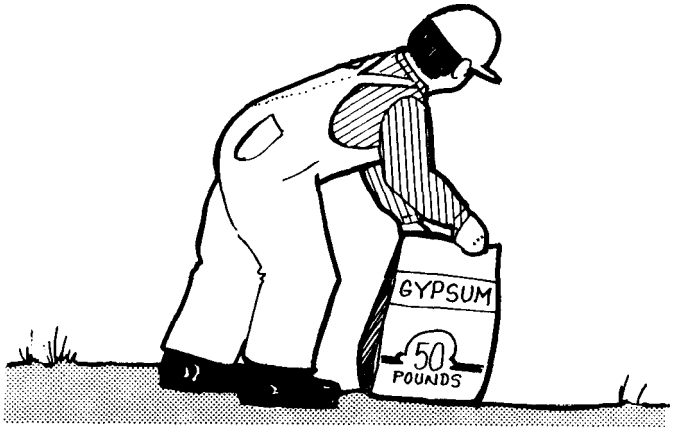
Damage to plants from contact with salt spray or mist can occur many feet from a street or highway. Evergreens may show immediate effects while deciduous plants may not show damage until the growing season after exposure. Symptoms include yellowing or dwarfing of foliage, or dieback and "witches broom" of twigs. Damage is usually more noticeable on the side facing the drift.

If possible treat by pruning dead or deformed branches and by washing away any surface salt residues. Treat for soil contamination if exposure has been long and heavy.

Damage from salt contamination of the soil is caused when moisture is drawn from plant roots. Above-ground symptoms include wilting, yellowing, or "burning" of the foliage and stems. Salt contamination of the soil can have a cumulative effect, but the brine solution is more likely to soak in when the ground is not frozen. Sodium from common salt can build up year after year of application.

Salts can be ***leached out*** of the root zone by a thorough watering if salt contamination is suspected. However, some difficulties will be encountered with tight, high clay soils that do not have good internal drainage.

To alleviate the adverse effects of salt (NaCl) in the soil, gypsum ($CaSO_4$) may be applied as a corrective or preventive measure. Rate of application will depend on the severity of salt contamination. For moderately contaminated soil, or where it is anticipated, apply 100 to 200 pounds of gypsum per thousand square feet over the affected area. This treatment can be made every three years. For heavily contaminated soil, apply up to 700 pounds of gypsum per thousand square feet, or 150 to 200 pounds per year for up to three years.



Gypsum may be applied to the soil surface to help alleviate soil contamination.

Powdered gypsum should be used to promote its solubility and movement into the soil. Gypsum is a naturally occurring substance that will not pollute the environment. It is frequently used as a soil conditioner or for clearing muddy water in ponds and is available at garden centers in 50 pound bags.

Plants that have been weakened by heavy or chronic exposure to salt may not respond to gypsum treatment.

Trees in pavement are vulnerable to contamination from salty run off.

Recommendations for applying deicers

Remember ***all*** chemicals commonly used for melting ice can have a negative impact on the environment, but their use may be necessary during icy winter weather. Because of their adverse effects, it is our responsibility to use ***chemicals with care.*** Plants growing in areas which are subject to exposure to deicing chemicals, especially common salt (NaCl), should be protected by using these preventative measures:

1. Remove ice by mechanical means if practical.
2. Create drainage channels or barriers around plants where deicers are used.
3. Use only the amount of ice melting chemical needed to do the job. Practice moderation.
4. Use dark colored abrasives as an alternate or supplement to chemicals.
5. Use calcium chloride ($CaCl_2$) rather than sodium chloride (NaCl) when fertilizers are not practical.
6. Apply gypsum if sodium chloride contamination is anticipated.
7. Be especially careful in applying salts in late winter or early spring, or when the ground is not frozen.